THE SUPPLEMENT TO THE

Tropical Agriculturist and Magazine of the C. A. S.

COMPILED AND EDITED BY A. M. & J. FERGUSON.

No. 2.] AUGUST, 1912. [Vol. XI.

EXPLOSIVES IN AGRICULTURE.

WANTED: TRIALS FOR COCONUT, TEA AND RUBBER PLANTING.

A great deal has lately been heard about the use of dynamite in agriculture, and some local interest has been aroused in the subject.

It would appear that "dynamiting" is specially useful in the preparation of land for the cultivation of trees rather than ordinary farming; and in a country where perennial crops are so extensively grown, it should be profitable to enquire into the possibility of using this novel method of preparing land for planting, particularly where the subsoil is of a hard, impervious description. In the case of hard cabook, or gravel soils, the use of dynamite would seem to be particularly beneficial. A tree planted in a free soil and subsoil has everything in its favour; but one with an impervious stratum below it, is at a great disadvantage, inasmuch as the progress of the roots is resisted by the hard subsoil. The latter tree will rarely be found to have anything approaching to a tap-root, and has to a great extent to depend upon the comparatively thin upper soil layer for its food-supply, which naturally tends to early exhaustion.

In many cases the subsoil is rich in the essential elements of plant food; but as water is the medium by which these are conveyed to the plant, and water cannot penetrate a compacted substratum of soil, these underground stores of food are not available. Very often, therefore, it is a case of carrying coals to Newcastle to manure lands of this description: the only treatment necessary being to break up the compacted substratum.

The method adopted in using dynamite for purposes of "holing" may be described as follows:—A hole 4 to 5 feet deep and about 1½ to 2 feet in diameter is made on the exact spot where planting is to be done. At the bottom of this hole is placed the cartridge of suitable dynamite, provided with the usual detonator and fuse. Next the hole is filled with moist earth and beaten down.

On exploding the cartridge, the surface of the earth will be seen to rise a few inches and subside, and after a few minutes smoke follows from the many cracks in the earth. If now the earth loosened by the explosion is removed with a shovel, it will be found that a pot-hole has formed at the point where the cartridge was laid, and that innumerable fissures extend far back into the surrounding subsoil.

It is reported that plants develop much more rapidly after such treatment of the soil than if placed in a spade-dug hole, since not only are the roots enabled to travel with ease, but it is also possible for water to permeate the subsoil and dissolve the plant food buried in it. The most important result of dynamiting land would seem to be that a reservoir for moisture is formed underneath, so that the trees planted promise to be drought-resisting.

An authority, writing on the subject, says that the treatment is beneficial for practically all soils and all types of plants. From this it would appear that there is no reason why dynamite should not prove useful in coconut, tea, cocoa and rubber planting. We understand that ordinary dynamite is unsuitable for agricultural purposes, and that a special kind, not stocked locally, is necessary. We should be indeed surprised if some enterprising members of the planting community—upcountry as well as lowcountry—do not make the necessary local trials before long.

A NEW EXPLOSIVE "ERGITE" COMING OUT.

July 10th.

Sir,—Your article and recent references to the use of dynamite or other powerful explosives for breaking up and deep trenching of the soil for agricultural purposes are of considerable interest. All who have any knowledge of agriculture are aware of the value of deep cultivation; deep ploughing, and double trenching in spade work, have excellent results in the crops, that follow such treatment of the soil. In the Tropics deep cultivation is known to be very beneficial, and in the case of such a product as Rubber it has been proved again and again that the larger and deeper are the holes in which the stumps are planted, the stronger and more vigorous will be the growth of the plant. And it is very probable that in a few years the use of explosives will be pretty general; and especially in the case of hard soils and where there is a rocky or hard sub-stratum the results will be very beneficial. Of course there are drawbacks to the use of such an explosive as dynamite, important among which is the danger and high cost of the dynamite. In this connection it may be of interest to your readers to learn that a new explosive will very shortly be put upon the market which will be particularly useful for agricultural work. For the past 30 years it has been the unceasing endeavour of the greatest explosive experts to produce a plaster dynamite by the simple admixture of non-explosive ingredients, that is, without the use of nitro-glycerine. This has now been accomplished, and the new explosive is possessed of all the advantages of the present nitro-glycerine dynamites without their disadvantages. It is of exceptional strength and shows no tendency to deteriorate on prolonged storage in hot climates and is unaffected by mixture. Further as regards cheapness, the total cost of production costs 3½d per lb. or £80 per ton cheaper than Gelignite.

This new and remarkable explosive is shortly to be placed on the market, and it will be of interest to Ceylon in that a Ceylon man just now at home is interested in the Company just being proved to acquire the patents and rights in the new explosive which is known as Ergite.

Further information will be available in due course.—Yours faithfully,

AGRICOLA.

NATIVE AGRICULTURE: AND OUR NEW DIRECTOR OF AGRICULTURE.

Mr, R. N. Lyne, our new Director of Agriuulture, arrived in Ceylon recently and made his first public appearance at the All-Ceylon Exhibition when he read a paper before the Ceylon Agricultural Society, on "Some Reflections on Rubber Planting and Agricultural Education" This by way of introduction to the following interesting letter from our correspondent "B.":—

The general opinion formed of the new Director of Agriculture after having heard his very able paper, was, that in him we have secured a very valuable asset; and that if he continues his work as outlined by him, he will advance native Agricultural methods and will confer almost incalculable benefits to the cause of native agriculture. I should have wished to say what I am writing now, at the meeting, but I am unaccustomed to public speaking and the presence of His Excellency and a galaxy of distinguished gentlemen, almost paralysed me.

The great mistake that Agricultural reformers make is to run down existing methods. That was the fatal mistake made by that good man, Mr H W Green, who gave the start to improved agricultural methods. He was an ardent reformer, but was not practical and was mulishly wedded to his opinions. His initial mistake was to use the heavy Swedish plough for paddy fields. This plough is too heavy even in high land for one pair of buffaloes. I could not hire a pair of buffaloes to work it on the sandy soil of a coconut estate. Besides, it ploughed too deep. Being ignorant of agricultural chemistry, Mr Green did not know of the evils of deep ploughing and of bringing to the surface the sour sub-soil and in many instances the sandy sub-soil. The villagers, whom he regarded as ignorant, know all this by practical experience.

I had a long correspondence with Mr Green on this subject and pointed out to him that the objections to the Swedish plough were: 1, its weight; 2, its high cost; and 3, the inability of the village blacksmith to renew worn out parts. Nothing would convince him he was wrong.

Mr Lyne is bound to succeed and to gain the confidence of the "goiya" and his sympathisers who are placed in higher planes than themselves. He struck the right chord when he stated: "according to his lights, the native cultivator knows his business. It is *our* business to try and understand his motives. Patience and an understanding of the motives of

the native are the important items of our equipment. What now the line of attack? In the first place I would aim at improving existing methods rather than aim at introducing new ones, and I would apply this principle especially in the case of implements."

The official dictum is, that when the people of the country receive Western education, they divorce themselves from their village brethren and do not understand them as well as the alien, ruling race, who generally converse with them through Mudaliyars. My education must be at fault because, though not Sinhalese or Tamil, yet being a Ceylonese, I yield to no one in my sympathy with the native agriculturists and with a personal knowledge of them and their methods. If Mr. Lyne, even through interpretation, converses with the "goiya" and asks him the reason for all he does, he will be surprised at his knowledge of agriculture. His methods are the concentrated experience of ages, and he will give a reason for all he does.

The opinions of Mr. Lyne as to the kind of plough for paddy-fields, which should replace the one that has been handed to goiyas from the remote ages, are practical and sound. Has he seen the Indian plough? It is made by the village artisans, and is as simple in construction as is our native plough, but is many times more effective in the quality and quantity of the work it does than is our plough. Mr. Drieberg introduced light iron ploughs which are almost as easy to handle and carry as the native plough, and is being used largely in the Hambantota District, thanks to Mr. Wolff, who has, unfortunately for the Island, severed his connection with the Civil Service. Have these ploughs come under the notice of Mr. Lyne? I did not notice them at the Show. Then there is another plough, the invention, I believe, of Muhandiram Rodrigo. It is the native plough with a mould board attached to it. Exactly what I told Mr. Green should replace the native plough. It is of local manufacture. Has this been shewn to Dr. Lyne?

Dr. Voelcker was sent to India to report on Agriculture and to suggest reforms. He was of the same sympathetic nature as is Mr. Lyne. After many months of study he came to the conclusion that European methods of Agriculture cannot be introduced into India in their entirety. Conditions were dissimilar. He was surprised at the knowledge of agriculture the *ryots* possessed. They had very good reasons for all their methods. He had very good suggestions to make.

There are a few things the *goiya* should be taught and by object lessons. His fields should be dry-fallowed. He should not mud-plough his fields as now, but should dry-plough them, turning the surface soil over completely so that the soil should be thoroughly aërated and the surface vegetation decayed. After the clods are completely broken up, he should let water into his fields. This is done in Southern India. The fields are ploughed in anticipation of the rains and not as in Ceylon after the rains. This is possible with the Indian and not with the Ceylon plough. He should be taught to have "dirt in the right places," that is in his fields, as is done in Southern India and in the Northern Peninsula here. All the sweepings, cattle droppings, old thatches from the roofs of houses, and in fact, everything is made into a big heap and carted to the fields and spread on the surface and ploughed in. The same with green leaves. The *Goiya* should be taught all this, as well as the benefits of hand planting paddy. His nursery should be growing while his fields are being prepared.

In this connection I must remark that as far as I can remember, comparisons are always instituted in the increase in *fold* between sown and planted paddy. The comparison should be in the *yield in bushels.*

Mr Lyne has a very big task before him. He can accomplish much, as he has sympathy with native methods, and has already completely grasped the situation. He has an able lieutenant in the person of Mr C Drieberg, the Superintendent of School Gardens.

That he may be successful is the ardent wish of

B.

RUBBER PLANTING IN BRAZIL.

Rio De Janeiro, April 12.—The commissioners appointed by the Minster of Agriculture to look into conditions on the Amazon Valley have now reported that there is a movement in favour of rubber planting in those regions. There has been a great deal of dilatoriness about this matter. Had a solid planting campaign been started some years ago Brazil's position today would be much better. As it is she will have a long way to go to catch up the Eastern planters. Her own stock of wild rubber, though still very large, is not inexhaustible, while contracts made some years ago requiring fine hard Para from Brazil are now running out, and as likely as not will be renewed for plantation rubber instead of for wild. The outlook is not reassuring.—London *Times*, *Supplement* May 30.

CEYLON'S PALM PRODUCTS.

JANUARY TO JUNE 1912.

All exports of Coconut Produce for the half year, save copra, are short of the corresponding figures for 1911; at the same time, it looks as if the year would be a very fair average one.

There is a serious falling-off in Coconut Oil as compared with other years, for 1910 showed no less than 254,691 cwt. exported against only 119,333 cwt. this year to date or, over 50 per cent less. We have not far to go to find the cause of this shortfall in Oil; it is doubtless owing to the greater export of Copra, practically all of which should be crushed locally. While our total export is so small, no less than 58,777 cwt went to Great Britain, or nearly 50 per cent, the Continent getting theirs in Copra, far and away the cheapest way of securing their supply of our Oil, as it includes the Poonac for stock feeding. No doubt the coal strike influenced home orders to a certain extent, and we know that some of the mills had to go slow in consequence for a time. Prices, local and home, were very steady from January to June.

Bad as the year so far has been for export business, we sent off during the period under review 205,156 cwt of Copra against 160,683cwt. in 1911, the average for 1909-1912 January-June being 243,791 cwt. It will be seen that Britain took only *501* cwt. in the first half of last year, and *none at all* this year to date; all went as usual to the Continent, to feed the oil mills. Prices ranged between Rs. 88 and Rs. 81 per candy for Estate Copra.

There has been a considerable falling-off in the export of Desiccated Coconut during the six months, we having sent away only 10,962,541 lb. against 12,257,773 lb. for the same period last year, the United Kingdom as usual being our best customer, with Germany and the United States coming next. The first half of the year is invariably the worst for this product, for the second half embraces Ceylon's best crop months. Owing to the coal strike at home orders for this product also fell off; but, strange to say, prices remained remarkably steady, ranging between 22½ cts. and 25 cts. for ordinary assortment with 25 cts. to 27 cts. per lb. for fancy grades. With fewer orders from home, mills had to go slow, while some were shut down for a month or so. With such splendid prices for our Desiccated Nut and Copra we cannot understand why a Negombo correspondent recently reported to us *a collapse* in the prices of those products,

There was a slight decrease in Poonac owing, no doubt, to the greater Copra export depriving mills of their proper requirements for crushing. Prices kept up very high; and this is hard on the poor carters, the growers' best transport friends. Their bulls were in anything but good condition, judging by the wretched animals to be seen struggling with their cruel loads over Colombo streets with their big ruts. A good deal of Poonac is being used as manure for Coconut gardens now, with the better prices procurable for Nuts.

There has been a considerable drop in the export of Nuts in shell, the total to date being only 5,237,979 against 8,140,437 in 1911. This was probably caused by high prices and shorter crops over this worst crop period—the dry cycle having told more severely than ever, on trees all over the nut districts.

Prices ranged between R60 and R70 per 1,000 mill delivery. Estimates for the year, so far, are nowhere filled. One gentleman states that his last picking this year was under *90,000* nuts; while the same land yielded for the same picking last year no less than *280,000* nuts. With such figures—which, we understand, are fairly representative—there can be little doubt that our palms have gone through the severest drought ever experienced in Ceylon, with a rainfall, taking Colombo figures, of 59·69 inches average over the 5 years ending 31st Dec. last; while North of Colombo, we doubt if the yearly rainfall, over the same period, would average *40* inches per annum—or less than *half* our Colombo average for the last *42* years, *82·32*. With such results, truly our Palm planters may safely be said to have come through the most trying time ever known by the oldest residents; but with the welcome rains to date, the Coconut growers' ship is well off in deep water once more.

As to Coir Yarn and Fibre there is a fairly good increase in our yarn exported, but Fibre is far in excess of any previous year, with 110,774 cwts. against 83,636 cwts. in 1911. With Mattress Fibre at R5 per cwt. in Colombo, a great impetus was given during last year, and this year to date; but it has fallen to R3 odd again. The raw husk went to R3 per 1,000, and one miller was paying no less than R5 per 1,000 husks. Mills were working full blast, and there was very healthy competition for the husk.

INLAND PLANTING OF COCONUTS.

AN IMPORTANT QUESTION FOR PLANTATION COMPANIES.

[*From a Correspondent.*]

The commonly accepted fallacy that the coconut palm, now one of the chief revenue-yielding trees of the tropics, must be planted near the sea to thrive has resulted in greatly restricting the planting of coconuts to regions in proximity to the sea or salty lagoons. It may interest companies and others owning suitable lands inland for the planting of coconuts to ascertain the truth of the matter as the proceeds from a good plantation of coconuts is certain to increase dividends. Careful investigations in the tropics embolden the writer to state that the coconut palm will grow far inland where the conditions of its environment include high illumination of the air, prevalence of winds tropical heat, adequate rainfall, proper soil contents and free underground mass water movement. The leaves will transpire freely, and the requirements of the palm be forthcoming for its sustenance and the production of coconuts. The foundation for the common belief that the coconut must be planted near the sea lies in the fact that it appears to have halophytic tendencies. It is notoriously given to thronging low-lying shores of tropical seas and salty lagoons. It is even seen in such places as the Antilles, where the palms are regularly washed by the sea at high tides. But there is a very simple reason for this gathering together of coconut palms on tropical sea-washed shores, and this is concerned with the propagation of the palm.

THE AGENCY OF WATER.

Water is simply the inanimate agent employed by Nature to enable the seeds of the coconut palm to stray away from one botanical province to another, so establishing new colonies, as it were. The means whereby Nature has enabled propagation to be carried on in the botanical world are marvellous in variety and design. The mosses, fungi and lichens, for instance, are propagated by an impalpable powder; some single individuals having ten million seeds. Some seeds, like those of the fir, are winged; indeed, there are said to be 138 genera having winged seeds. We are familiar with the large number of seeds which have been furnished with downy appendages when ripe, enabling them to be carried enormous distances by the gentlest breezes. There are certain aquatic plants whose seeds take the form of shells and thus drift along to new homes. The coconut is so designed as to float in water with a minimum liability to injury, and it is water currents which have caused coconuts to be distributed on low-lying tropical shores amid abounding fecundity. Of a nut so cast up we can easily imagine the history from the quickening of the seed to the maturity of the palm. It becomes at once apparent that the heavy nut must remain more or less near the water, being too heavy to be carried by the most powerful of birds, and even by that other common seed distributor—the wind. Many a hurricane has, doubtless, played a part in the distribution of the coconut palm a little way inland, as may be the same with whirlwinds, but it remains to that busy seed distributor—man—to bring into being coconut plantations in inland places, for man has been the means of transporting all manner of seeds into regions where, but for him, they would never have penetrated. It may be accepted that granted suitable conditions, a coconut taken and planted by man with careful design inland will flourish just as well as if it were cast by chance upon some sea shore or embedded in the warm mud of some estuary.

INLAND GROVES.

Reliable witnesses have described magnificent groves of coconut palms observed in India, far inland, healthy and abundant crop yielders. More and more planting is being carried on in the inland parts of Ceylon. As regards Mexico, the writer examined in Chiapas, Mexico, majestic palms bearing excellent nuts as far away as 120 miles from the sea. While on the Isthmus of Tehuantepec, some 90 miles from the sea, on the River Coatsacoalcos, he found coconuts with substantial kernels. Strong winds, the glare, may-be, of the water, the purity and high illumination of the air which mark tropical seashores, among other conditions, render them pre-eminently suitable for coconut plantations. It has been a source of surprise that a sandy soil by a seashore should contain a sufficiency of food for the palm—a great vegetable organism requiring a large supply. The following figures may be of interest in this connection:—Allowing a specific gravity of two, and 20,000 metres of soil to the hectare (about 2½ acres) we have 40,000 tons of soil from which the palms can obtain what they require. Taking 70 trees to the acre, or say 173 to the hectare, yielding 80 nuts per tree per annum as a maximum, and a fall of 16 leaves per tree per annum, there is an annual drain on the soil of about 400 lb nitrogen, 600 lb potash and 185 lb phosphoric acid. In the 40,000 tons of soil, being average soil near the sea, it is estimated are ·07 per cent. nitrogen, ·50 potash and ·07 P. acid, giving 28 tons

nitrogen, 200 tons potash and 28 tons P. acid. Thus it would take over 150 years to exhaust the nitrogen, over 740 years to exhaust the potash and about 340 to exhaust the P. acid. It may naturally be surmised that the chemically richer soils inland would conduce to greater productivity of nuts. The conditions inland are, however, generally less favourable to great transpiration, the chief agent—the wind—being much less in evidence. Experiments made with 1,000 nuts obtained from palms growing along sea shore and 1,000 nuts from palms grown inland seemed to prove that the yield of oil per nut is almost exactly the same. The husks from the sea shore nut were much larger than from the inland nuts. The superiority of the sea shore nuts was shown to be in the quantity, not in the quality of the nuts produced. It is claimed that underground water movement has much to do with the matter. This movement is caused by the pressure of the wator particles inland during the rising of the tide, and by the movement of the water particles outward at the falling of the tide, which brings about the constant refreshment of the feeding ground of the coconut palm roots. Salt water itself has been found to exert little effect on the palm. A negligible quantity only of chlorine has been found at the base of trees actually growing in the sand. It is recorded that it requires but six years for the palm to reach maturity on plantations in proximity to the sea, as against nine years on plantations inland.

In conclusion, it may be pointed out that the coconut palm will grow in all manner of curious places. At Zanzibar the soil in which the palms are found is of coral origin. In the Zambesi Estuary much black mica is found ; yet the palms show, it is said, extraordinary development, and in the Seyohelles the sea hills upon which the palms flourish are of volcanic origin. At Trinidad the finest plantations are found on the banks of marine marshes. Enough has been said to show the important fact that some of our land and plantation companies will be able to plant ooconuts where awhile ago it would not have been thought possible to do so.—*F. Times*, June 18.

IRRIGATION IN COCONUT PLANTING.

A new departure so far as this District is concerned has been made by Mr. Cotton on the Easter Seaton estate. He has installed a pump for irrigation and intends to irrigate his coconuts. The channels will be made of clay. We shall be interested to watch the results of this experiment.—" The Lamp," July 6.

CULTIVATION OF THE PAPAYA.

The Philippines Bureau of Agriculture has issued the following directions for growing papaya, which should prove of interest and be useful to growers of this delicious fruit:—

Seed Bed.—The seed bed should be prepared by thoroughly pulverising the soil by spading or hoeing the ground well, and the clearing away of all weeds and trash. Sow the seed thinly, about 1 to 2 centimeters apart, and cover the seed not more than 1 centimeter with soil, then water the bed thoroughly. In the dry season it is well to make the seed bed where it is shaded from the hot midday rays of the sun under a tree ; or it may be shaded by the erection of a small bamboo frame, on the top of which are placed grass or palm leaves. If the seed is planted during the rainy season, a shed of palm leaves should always be put up over the seed bed to protect the seed from being washed out and the plants from being beaten down by the heavy rains.

Transplanting.—When the plants have attained a height of about 7 to 10 centimeters, they are ready to be transplanted to the place where they are intended to grow.

Unless the transplanting has been preceded by a good rain, the plants should be thoroughly watered before they are removed from the seed bed. In order to reduce the evaporation of water from the plants until they are well established in their new quarters, about three-fourth of the leaf-blades should be trimmed off.

In transplanting, take up the plants with so large a ball of earth that as few roots are cut or disturbed as possible. Do not set out the young plant deeper in the new place than it grew in the nursery ; firm the soil well around the roots, making a slight depression around the plant, and water it thoroughly.

In order to protect the tender plant from the sun until it is established, it is well to place around it a few leafy twigs at the time of planting. It is well to set out three plants to each hill, and, as the plants grow up and fruit, to dig out the males or the two poorest fruiting plants.

If the plants cannot be set out in the field at the time indicated, transplant them from the seed bed to a nursery, setting out the plants about 20 to 30 centimeters apart in rows a meter apart, or more, to suit the convenience of the planter. While the best plan is to set out the plants in the field before they are

more than 30 centimeters (12 in.) tall, the plants may be transplanted to the field from the nursery with safety after they are more than 1.5 meters (59 in., say 5 ft.) high, *provided that all except young and tender leaf blades are removed leaving the entire petiole or leaf stalk attached to the plant*; if the petiole be cut close to the main stem, decay rapidly enters it. If the entire petiole is left, it withers and drops and a good leaf scar has formed before the fungi have had time to work their way from the petiole into to stem of the plant.

TREATMENT OF OLD PLANTS.—When a plant has grown so tall that it is difficult to gather the fruit, which also at this time grows small, cut off the trunk about 75 centimeters (28 4-5 in.) above the ground. A number of buds will then sprout from the stump, and will form several trunks that will bear fruit like the mother plant in a short time. These sprouts, except two or three, should be cut off, for if all are permitted to grow the fruit produced will be small.

SEED SELECTION.—Seed should be saved from the best fruits only. By this is meant not so much a large fruit as one that is sweet and well flavoured, with a small seed cavity and few seeds; oblong fruits should be preferred to roundish ones in saving seed, as they grow in plants having both stamens and pistils in the same flower; and these being, very largely, self-pollinated, the seeds produced from such flowers are more likely to produce their kind than the seed from roundish, melon-shaped fruits, which mostly grow on female plants.

All male plants should be destroyed whereever they appear, as not only are they unproductive but their pollen being carried to the fruiting plants they tend to produce degenerate plants when these are grown from the seed produced on plants growing in the vicinity of the male plants.

There is no need to fear that the other plants will not fruit if the male papayas are destroyed, for the reason that there are always plants about having *perfect* flowers, and which provide sufficient pollen for the fructification of the female plants. This applies particularly to the Hawaiian papaya.

General Remarks.—The papaya is very impatient of water standing around the roots, and should be planted only on well-drained land; being easily injured by strong winds, it should be planted in sheltered situations

Keep the land clean of weeds and the plants well mulched.

THE CHERIMOYER.

If it is true that "one good European pear is worth all the cherimoyers of Peru" put together, then it must, by far, be truer that one good cherimoyer is, in its turn, worth every other anona of the West. For, though it is at present neither known nor grown to the extent to which it deserves to be, this

SWEET, LUSCIOUS, DELICATE-FLESHED

fruit is pre-eminently the

KING OF THE CUSTARD-APPLE TRIBE.

Child of the arid desert though it be, it does not "waste its sweetness to the air"; for, though economically it is still the least, pomologically, it is the greatest of the group of edible fruits to which it belongs. It is esteemed by the Peruvians as one of their choicest, and enjoys the distinction of being deemed worthy to rank among even the three finest in the world,—the other, more familiar, members of the triad being the Malayan mangosteen and the Brazilian pineapple. And, though it has to be remembered that as a rule the merits or otherwise of a fruit are made to depend very much upon those qualities of it that conform to the personal tastes and predilections of the traveller or promologist who describes it first, nevertheless, it will be conceded in the East, wherever this veritable "sugar-apple" is known, that the West has given it no better fruit. The cherimoyer is but one of half-a-dozen fruits of its kind, which the occidental tropics have bequeathed to the world; it is also the latest of all the anonas to reach the gay shores of the flaming East,—a region which, with its varied natural conditions, has hitherto always offered a home so congenial, for the greater part, to the needs of these aliens as to have resulted in doubt itself being cast upon the claims of the West as their habitat. Like the shady, diffuse-branching bullock's heart tree (*Anona reticulata*), the cherimoyer (*Anona Cherimolia*) attains to a height of 20 feet; and like its and those of other anonaceous plants, the flower consists of six petals, in two rows, while, the indefinite number of its carpels unite to form a many-celled fleshy fruit. The plant is indigenous to the mountains of Peru and has been naturalised not only in the islands of the West, but also throughout the vicinity of its home. It is said to be a lover of open hill-sides, to demand a hard calcareous soil, and to thrive only in climates that are dry. But, though these requirements may be indicated, the cherimoyer can, as a matter of fact, be

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GROWN WITH SUCCESS ON A VARIETY OF SOILS IN THE COOL MOIST CLIMATES of the warm parts of the globe: It flourishes on the laterites and loams of the West Coast, and is likely "to take" to the hills of Prome, where its cousin the custard-apple is established as a forest. The adaptability of the species in responding to factors of climate and soil that are foreign to it and seemingly unfavourable to its acknowledged requirements must be regarded as a feature of some significance in its possible wider prospective dissemination. Burma is a country in which good fruit is scarce; its "grapes are sour," in a literal sense, and, though the indigenous Upper Burman mango is better, the majority of the very large output of its native fruits is of a quality, which cannot be said to pass muster with other similar grades in the East. It is, however, a great fruit-eating country,—greater, in fact, than many others of its size: it consumes with avidity all it can get and will eat any, whatever its odour or taste, that can be conveniently eaten at all. Consumption of fruit often begins with that of the flower even whilst it is enclosed in the bud and, continuing with zest through all the stages of its growth, fails to stop even at putrefaction itself. In the presence of conditions of "taste" such as these, it will, I believe, be conceded by many that there is a great future for fruit cultivation in Burma,—for improvement in the grades of its indigenous fruits and for the introduction of others both cheap and good. The cherimoyer, which may be grown with just the same ease as any of the other naturalised anonaceous fruits, points to being one in this select latter class; and, if successfully grown, is likely to become a greater favourite with the Burmese than even the "sweetsop," for, it is both sweeter and prettier by far, and they are a people that is ever charmed with all that is really pretty and sweet.—A.M.S.—*Capital*, July 4.

BORNEO RUBBER.

The *British North Borneo Herald*, of June 17th, states:—Mr. Aston, the general manager, took us over the Leila Park Estate, where on the steep rocky land above and beyond his bungalow are planted some 38 acres of rubber and coffee (robusta). Here is an example of what rubber can do: boulders sticking out here, there and everywhere, and yet not an inch of planting space wasted, and the rubber, except on the most exposed hill-tops, or where the deer had been nibbling at the top shoots, looking wonderfully well. The furthest boundary of this estate is only a little over a mile from the Government offices, and the company must be congratulated on making full use of the whole of a very valuable property so close to the town.

SMOKE CURING FOR PLANTATION RUBBER.

In directing attention to the following information about Mr. Wickham's "Mocha" apparatus we would remind rubber growers that his object has been to approximate the preparation of plantation rubber as nearly as possible to the lines so long followed with success in the original home of rubber—the Amazon forests. It is interesting to learn from Mr. Wickham that the different nuts used in South America in producing the smoke in which "Para" is cured, all belong to the same species as the Coconut, which was utilised at Peradeniya last week. It is thought that the preservative properties of the essential oils, which are communicated to the rubber, are the main elements in obtaining the fine keeping qualities of hard Para, and as the "Mocha" machine follows this idea out, growers of plantation rubber ought certainly to give it a full trial. We understand that the cost will not be so great as the present coagulating and drying methods, and if there is greater keeping quality in the rubber produced by the smoke method it certainly ought to be striven for. The chemists have not yet decided whether the other properties of rubber such as elasticity and tensile strength are intensified, or at any rate fixed, by smoke curing; but there is every reason to believe this is so, in addition to giving it the means of capacity for keeping for a longer period than ordinarily prepared "plantation."

Mr. H. A. Wickham's Mocha Rubber Smoking Apparatus.

We learn from Mr H A Wickham, the "father of the Rubber industry," that the model of his Mocha rubber-smoking apparatus, intended to produce the equivalent of fine hard Para by means of its "smoke cure," is being brought down to Colombo and overhauled by the Colombo Commercial Company, agents for the manufacturers, Messrs. David Bridge & Co., and that a demonstration with it at their works will be held before long.

It is interesting to add that although no use appears to have been made of the small working Model B. of this apparatus, since its arrival in the island some months ago, a demonstration was held under Mr. Wickham's supervision at the end of last week at Peradeniya Gardens, where it has remained since its arrival, and was witnessed with great interest by the Director, Mr. Lyne, and the Peradeniya officials. It worked very satisfactorily, and will no doubt

become popular as soon as the machines are placed on the market locally.

Mr. Wickham also experimented with his now well-known tapping knife and found this answered, too, to expectations in every respect, except that possibly with older trees and hardened bark, the spring of the knife would be more useful if it were of a stronger make. It appears that part of the essential working is that there should be a rapid withdrawal after the incision, and that the speed of the withdrawal will depend on the strength of the spring, hence the need for this slight improvement in the implement. Both the inventions are the outcome of half-a century of experience and unrivalled early acquaintance with the practices of the rubber-gatherers in the home *par excellence* of Hevea rubber, Brazil.

INDIGO FROM CEYLON.

Among July's exports figured 14 chests of Indigo, manufactured at Lagos estate, Kalutara—the first fruit of the introduction of a new industry into Ceylon. The Indigo plant at Lagos is ready for another cutting, and manufacture will be resumed there in a few days. The Clyde Tea and Rubber estate will shortly put 100 acres of a new clearing into Indigo. Dr. Cuntze's new place, Penihela estate, near Veyangoda, has also been planted out in Indigo, and the factory erected there by Messrs. Macdonald & Co. is finished, and manufacture at Penihela will be started in a couple of weeks or so.

RUBBER AND INDIGO.

Baron Schrottky on the Coming Crisis in the Rubber Industry.

And Protective Measures.

(*To the Editor*, "*Straits Times.*")

Sir,—The rubber planting industry has, for many years past now, been trying to find a catch or cover-crop, which would give some return during the time the rubber grows up, while not exhausting the soil and thus retarding the growth of the main crop.

None of the catch-crops so far grown have come up to this standard. Will you allow me, therefore, to draw attention through the medium of your paper to a crop which has been grown lately most successfully between young rubber in Ceylon and seems to have solved the question of what crop can most profitably be grown with rubber.

I refer to indigo. Due to the cultivation of a better yielding variety of the plant, to improved methods of manufacture, and to the marketing of the dye in the form of a paste, natural indigo can now be made considerably cheaper than the synthetic dye and an indigo industry on up-to-date methods of manufacture will once more become one of the most profitable undertakings of the tropical planter.

For, apart from the profit which the outturn of dye yields, we have as a by-product the refuse of the indigo plant, after the extraction of the dye, one of the most perfect manures in the world which Prof. Rawson states is equal to the best English farm-yard manure, and the commercial value of which—ammonia, potash and posphates only—he gives as amounting to $21 per 8,200 lb.

The Malay Peninsula—as regards climate and soil—is eminently suited for the cultivation of indigo, either alone or between young rubber or coconuts. It is one of the few plants which enrich the soil by deposits of nitrogenous products from its root nodules and its long tap roots draw nourishment from strata, which are not ordinarily reached by rubber or coconuts, in the earlier stages of their growth.

Grown in Ceylon between young rubber, the rubber trees have grown best where the indigo was growing close up to them and where it was thickest.

An outturn of 40,000 lb. of green plant per acre may be expected here in the Malay Peninsula for the year, in 4 to 5 cuttings, and the plant will continue to yield for 3 to 4 years, without re-sowing being necessary. The 40,000 lb. green plant after the extraction of the dye, will yield 32,000 lb. green manure, and this applied to rubber or coconut trees should return a good value, far and above its commercial manurial value, in the quicker and more robust growth of the young trees, a larger yield of latex and a quicker renewal of the bark, as regards rubber, and in the case of coconuts quicker growth, earlier bearing of nuts and an outturn of a greater quantity of nuts per acre.

But it is chiefly in connection with rubber that I want to draw attention to indigo.

There can be no doubt as to the seriousness of the position. Sir William Ramsay is at the head of his profession. Synthetic rubber has come, and Sir William Ramsay will make good his statement that it can be made at one shilling per lb. Let the rubber industry face this, and take timely measures to strengthen its position.—Yours, etc.,

SCHROTTKY.

Singapore, July 8th, 1912.—*Straits Times.*

TEA ESTATES AND SOIL EXHAUSTION.

(TO THE EDITOR, "FINANCIAL TIMES.")

Sir,—May I ask for the courtesy of your columns in order to draw further attention to the exhaustion of soils which appears to be taking place on tea and other estates in India and the East? It was specially referred to by Sir Annesley C C de Renzy at the annal meeting of the Jokai (Assam) Tea Company, Ltd., reported in your issue today. In this particular case no less than 237 acres of what were "not long ago regarded as the most valuable of the company's lands" are at present derelict through exhaustion. The speaker considered it possible to restore the fertility of these lands at a moderate expense, and undoubtedly every possible means will be considered by the company in order to bring about this desirable end. The same problem must be appealing for settlement to many other companies in a similar position.

I do not know what was the solution in Sir Annesley de Renzy's mind, but I should like to suggest to him, and, through you, to all other directors, that more attention should be paid to the restoration of exhausted lands by the means of green manuring. I know that the Indian Tea Association has dealt with the matter to some extent, but I am not aware that the practice is generally carried out on estates. Even if it is, it is probably confined to the use of Crotalaria, Dadaps and the like—perhaps also some Soya beans—but there is a little known West Indian légume called "Desmodium tortuosum," which has been strongly recommended by the United States Board of Agriculture, that I think ought to be of considerable value to such estates as the Jokai.

The "Farmer's Bulletin," issued by the U. S. Bord of Agricultue, is too long to quote here, and it is, unfortunately, out of print at Washington but I am having it reprinted for distribution to any who may be interested, if applicants will be good enough to send a stamp for return postage.

Summarising it, the more important of the advantages claimed for this fertiliser are:—As a légume it, of course, collects nitrogen from the air; also, it takes up large quantities of lime and potash, one-half of the total amount of ash consisting of these elements. If turned under for green manure, a 4-ton crop of "Desmodium tortuosum" would supply an equivalent of half a ton of the best commercial fertiliser. If sown for feeding, two crops are available in a season, and it is taken greedily by all classes of stock, making also excellent hay.—I am, &c.,

STUART R. COPE.

33, Great Tower-street. E. C., 13th June.

—*Financial Times*, June 15.

SALES OF PRODUCE IN BRITISH AND CONTINENTAL MARKETS.

Fibres, Cotton, Grain, Oil Seeds, Hides and Skins, Timber, Rubber, Drugs, Wool, Ores, Mica, Gums, Tea, Cocoa, Coffee, Copra, Sugar, etc., are being regularly dealt in; Keymer, Son & Co., being selling Agents for Estates, Mills and Exporters.

Samples valued. Best ports for Shipments indicated.

The management of Estates undertaken. Capital found for the development or purchase of valuable properties.

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Cables:
KEYMER, LONDON.

Sir,—Having just returned from West Africa, where I was examining rubber, cacao coffee and kola lands, I read with much appreciation the letter from Mr Stuart R Cope in your Saturday's issue upon the manuring of exhausted soils and should like to support his please for green manuring. In lands otherwise desirable in every way for rubber the one thing lacking has often been nitrogen in sufficient quantity. Green manuring is now being tried upon such lands, and there is reason to believe that the experiment will become a practice. We have not yet tried "desmodium tortuosum," but shall be willing to experiment with it if Mr Cope cares to send a sample.—I am, &c.,

H. O. NEWLAND.

Cambiran Lodge, Knollys-road, Streatham
15 June.

—*F. Times*, June 17.

THE RUBBER CONFERENCES AT NEW YORK.

At the first American Rubber Exposition, to be held at the Grand Central Palace, in New York, next September, the conferences, it can confidently be stated, will play a most important part. A number of those who contributed most successfully to the valable work of the London conferences will be in attendance, and, in addition, many who did not take part in London will be present and participate actively in New York. Many of the best-known rubber men abroad will be present and will bring important and valuable contributions, and many of the recognised leaders in the rubber world of America have expressed their willingness to address the conference.

It might be thought, possibly, that men who are engaged in experimental work would hesitate to give publicity in this way to the result of their researches and discoveries. Of course, there are always a few men who think they are the losers if they impart any information of value that has come to them through their own experience, but these men are in the minority. It is safe to say that most of the leading men in the rubber industry take a very broad view of this great department of human activity, and are very glad to contribute to its general advancement in any way they can. Rubber men who attend the New York Rubber Exposition may rest assured that they will not only see the most interesting collection of the physical products of the rubber world, but will be able, by attending the conferences, to carry away with them a great fund of new and valuable rubber knowledge.

NOTES OF THE PAPERS.

Mr. Cyril E S Baxendale has been appointed by the planters of the Federated Malay States, and will read a paper in connection with the rubber industry of that country.

Dr. Frederic Dannerth has accepted the position of Honorary Secretary of the Conference.

F. A. Stockdale, Esq., Hon. Secretary of the Permanent Exhibition Committee of British Guiana, will have a paper read in reference to the rubber industry in British Guiana.

T. W. Miller, Esq., of the Faultless Rubber Co., will read a paper on dipped rubber goods.

Francis E Lloyd, Esq., recently resigned from the Alabama Polytechnic Institute to take the position of MacDonald Professor of Botany, McGill University, Montreal, Canada, will read a paper upon "Some Effects of Acclimatization Upon Guayule."

Dr. L E Weber, of Boston, will read a paper on some important subjects in connection with rubber chemistry.

As invitations have only recently been issued, it is impossible to say the exact number of papers that will be read and their subjects, but in our next issue we hope to be able to give a full list.

It is expected that about 300 delegates from different countries will visit New York to take part in the Exhibition and Conference.

Dr. D G Bosor, Secretary of the Hungarian Association of Chemical Industry, will be in New York, and has indicated his intention of taking part in the Conference.

Dr. Huber, of Pará, the great rubber expert of Brazil, has intimated his intention of being present on behalf of the Government and will attend the Conference.—*India Rubber World*, July 1.

A NEW RICE-REAPING MACHINE.

It is reported that a new rice-reaping machine has given highly satisfactory results in Italy and was awarded a prize of 5,000 lire in the international competition for rice-reaping machines promoted by the Farmers' Association of Vercelli. It consists essentially of a reaping mechanism driven by a small gasoline engine and mounted on a large wooden wheel and on a hollow cast-iron skid. This skid is placed as far below the centre of gravity of the machine as possible, and also is made ingeniously to serve as a reservoir for water for cooling the motor, and further, by the fact that it is partly filled with water, to add an important gravity action. The lower surface of the skid is placed two or three inches above the lower rim of the wheel. In this wise, any tendency of the wheel to sink in soft earth is checked. One of the most important functions of the skid is due to the fact that it is partly filled with water. When a hillock, hummock, or furrow is to be crossed and the forward part of the skid rises, the water runs toward the back of the skid. By the same token the water runs forward when the forward part of the skid is depressed after a hillock is passed and adds a useful downward impetus to the machine. The reaper has amply demonstrated, it is stated, its ability to reap over 7½ acres of rice in ten hours. —*Indian Trade Journal*, July 25.

AGRICULTURE IN CHINA.

MODEL FARMS AND OTHER EXPERIMENTS.

Now that the Chinese giant is fairly awake, and shaking off his lethargy of ages past, the world may look forward to some rare developments within the vast domain of the new Republic, under the administration of Yuan-Shi-Kai. The *Peking Daily News* regrets to learn of proposals by the Board of Agriculture to turn the "Temple of Heaven" into a model farm, the "Temple of Agriculture" into an experimental forestry station, and the "Temple of Earth" into a horse breeding establishment. This feeling, however, is not shared by the majority of people, who are anxious that China should shake off the antiquated methods that have marked her slow progress in the past concerning agricultural developments. Any idea of improved methods will be welcomed by the thousands who are steeped in poverty for want of means by which to make even a scant living. The absence of scientific cultivation, and the impoverishment of the soil, has been largely due to the fact that the original forests have been destroyed. The *South China Post* calls attention to the pitifully small fields of China, which barely feed her millions, but at an expense—in labour and disease—that no other country pays. Experimental stations would work wonders in that country, as it would not be long until the great expanses of land which now lie fallow, would be turned into waving fields of grain, and gardens of as fine vegetables as can be produced anywhere in the world. It is estimated by a British agriculturist, who recently made scientific investigations of the soil in China, that it contains all the properties for the propagation of not only wheat, but almost every cereal in the world, and the climate is said to be ideal for agricultural development.

Already a number of agriculturists are in China, making experiments in planting, with a view of establishing a number of large grain farms, and working with them, are the Government Agents, who in many cases are Britishers, Americans and Australians. The new Republic has recently made over 100 European appointments in the different departments, and it is understood Dr. Sun-Yat-Sen's policy to "learn all that the white man knows and more" will be carried out with elaborate details. The great curse of China's development has been that when droughts and disease visited the

land and people, no Government was behind them to aid and encourage, or suggest remedies. The policy of the new Government is to combat and eradicate these evils at once and establish a system of experimental stations to advance the cause of agriculture in the country.

China has over 400,000,000 people. More than one-half of them live in the depths of abject poverty. This is not due to indolence; in fact, the Chinaman is one of the most industrious of all the Oriental races. Where it requires four or five native servants in Ceylon to do the work of a bungalow, and even more upcountry, one or two Chinamen will do all such work and more, with accuracy and amazing skill and they are the most silent workers in the world. We are not defending Chinese labourers against Sinhalese or Tamil; but we are inclined to believe our natives could learn some valuable lessons from the Chinese in points of industry, order and system. Dr. Elliott, president of Harvard College, when in Ceylon, made the remark, *en route* upcountry, to a well known Ceylon agriculturist: "If the Chinese had your country, there would not be a yard uncultivated, where anything could be made to grow, and they would turn the island into the finest garden in world."

In China the people would have done this very thing, had they had the opportunity of securing land from the Manchu government, and any support in its development. Now that the new government encourages and will aid in the agricultural pursuits of that country, we may look for marvellous results in the next few years. Not only will large areas be developed into farms and vegetable gardens, but tea, coffee and sugar are being pushed with great energy, and millions of capital are awaiting the results of the experimental stations in planting through the various districts where these products can be made to grow. North and north-west China have a temperate climate, with cold winters, much the same as in England, while in southern, south-eastern and south-western China, the climate varies from a semi-temperate to almost tropical, so that nature has provided bountifully both as to climate and soil for the development of the country. With this development, China will take a very important position in the producing countries of the world, and many nations will have to look to their laurels, lest the Chinese people surpass them in the agricultural pursuits of the future.

RUBBER IN THE F.M.S. IN 1911.

THE DIRECTOR OF AGRICULTURE'S REPORT.

In the report of the Director of Agriculture for 1911, from the pen of Mr Lewton Brain, published in the FMS "Gazette," we find a most important contribution to "current rubber literature." The Director, although a comparatively young man, and less than two years in the Colony, comes to his work without any of the prejudices brought by prospectus writers, promoters, sellers of estates, or boomers of estates in which they already hold shares. What therefore he has to say, unprejudiced as to cash, and from the scientific and economic point of view, possesses more than a passing interest:—

The year has been one of quiet and steady development, altogether a much more satisfactory state of affairs from the agricultural point of view. The market price varied from 4s. 6d. to 7s. 4d. and though showing a wide variation, the tendency towards the end of the year was to stability, and forward sales indicate an equal steadiness.

Mr Brain gives these prices of cost of production in cents as returned.

	Perak	Selangor	N. Sembilan	Pahang
High	2 40	3.78	2.46	1
Low	.19	.28	.24	.60

These figures are supposed to be inclusive of the entire cost of the area in bearing, but not the upkeep of the untapped area, but evidently this is not strictly adhered to. On a good estate the cost of production per lb. should not exceed 1s. 6d. per lb.

ACREAGES.

The land opened for rubber in the Federated Malay States during 1911 reached the enormous total of 107,200 acres; this is more than double that opened during 1910, which again was higher than any previous year. The largest increase is recorded in Perak, where 40,791 acres were opened as against 15 612 in 1910; the 1911 openings, in fact, increase the total Perak acreage by about 50 per cent. In Negri Sembilan the proportionate increase was enormous, rather more than 66 per cent.; 30,480 acres being opened in 1911 as against 44,868 previously. It is possible that part of the total increase shown is due to a more thorough census having been taken this year, but this will hardly account for more than a fraction of the total.

The rubber output for the Federated Malay States in 1911 is returned as 21,809,617 lb., an increase of about 75 per cent. over that for 1910—that year's figures were 12,563,220 lb, against 6,083,493 lb. in 1909. Had it not been for the drought, to be referred to later, there is every reason to suppose that the 1910 optput would have been doubled.

The Produce.

The acreage producing at the end of the year in the Federated Malay States totalled 105,635, which gives an approximate yield per acre of 2 0 lb. It must be remembered that a good deal of this is rubber brought into bearing during the year, and that some of it was tapped for only part of the year. Of the total 105,633 acres, 85,579 probably represents rubber planted before 31st December, 1906, and the remaining 20 000 about one half the acreage planted during 1907.

The percentage increases in the production of rubber for the States is approximately:

Selangor	...	57 per cent.
Perak	...	100 ,,
Negri Sembilan	..	65 ,,

while the Pahang returns show a total crop of 31,144 lb. The crop in Selangor is still nearly double that of Perak, which is the next highest State.

The output for 1911 would doubtless have been considerably higher but for the abnormally dry weather experienced during the early part of the year. Conditions were so bad in some districts that several estates had to cart their drinking water for estate staff and coolies several miles. Even on estates where this necessity was not felt, the yield of rubber fell off, in many cases from 25 to 30 per cent.

The total estate labour force for the Federated Malay States is returned at 166,015 as compared with 128,446 in 1910, an increase which hardly keeps pace with the increase in acreage. The average works out at rather less than one cooly for two acres. The returns of the Indian Immigration Department show a satisfactory increase in the number of Indian immigrants and a satisfactory decline in the proportion of those returning to India.

These are only a part of the valuable details Mr. Brain gives in his report. From his chapter on "cultivation" the following are a few extracts:—

How Close to Plant.

Discussion still continues as to the best planting distance, though wider planting is finding more and more supporters. I do not think that any unprejudiced observer going round some of the older clearings and seeing the manner in which closely planted trees are crowding their foliage together, are losing their lower branches from light starvation and are failing to renew their bark properly, can fail to come to the conclusion that one hundred trees to the acre is the maximum number that should be allowed. Even if this be reduced to eighty by accidental losses and by diseases and pests, there would still be an ample number to occupy the ground and air. Whether planting 20 by 20 feet or 30 by 15 should be resorted to is a matter of convenience in working, and not of fundamental importance.

Catch Crops.

Catch crops are still little in favour and practically only used where it is absolutely necessary to secure a certain amount of revenue before the rubber itself comes into bearing. In the Federated Malay States only 13,382 acres out of a total of 353,974 under rubber are interplanted, or less than four per cent; in 1910, the corresponding figure was 13,977 acres or nearly six per cent. Coffee (mostly coffea robusta) accounts for 5,511 acres of the total and is the principal catch crop grown. Over 2,000 acres are under rubber and coconuts—a particularly unsound mixture of two particularly sound cultivations. Sugar, gambier, tapioca, and pepper probably account for the greater part of the remaining interplanting.

In the Straits Settlements nearly 9,000 acres of a total of 80,000 are interplanted, or about 11 per cent, as compared with 9,640 acres out of 60,000 in 1910. In both the Federated Malay States and Straits Settlements there is an actual decrease in the interplanted acreage, not only a proportional one.

Cover Crops.

The Department of Agriculture is still experimenting with a large variety of cover crops, some twenty two species of leguminous plants having been tried at Kuala Lumpur during the year. The ideal to be arrived at is a rapidly growing plant which quickly shades the soil sufficiently to keep down the weeds; it should also have a short life so that within the year it can be cut down, dug in and resown, thus providing for cultivation, improvement of the soil and eradication of weeds. If such a cover could give a product of commercial value at the same time, this would be an additional advantage, but the soil treatment should be the first consideration. Some of the plants tried appear to

give promise of being good covers, but the first year's results with leguminous crops are usually uncertain.

LACK OF CULTIVATION.

The cultivation usually given to rubber trees is hardly worth the name, consisting, in the majority of cases, of a scraping the surface of the soil to remove the weeds. I am of opinion that more than this is required to induce and maintain healthy soil conditions. At least once a year, probably twice would be better, the soil should receive a thorough cultivation to a depth of at least four inches. This would break up the hard surface layer and allow the free access of air to the soil in which the roots are feeding, and would thus tend to create a healthier condition for root growth and for the continued production of available food salts in the soil. The roots would not tend to grow in the surface layer but would be forced deeper into the soil. During dry weather the trees would not suffer to anything like the same extent they do now, as the soil water would be prevented from rising to the surface when it evaporates. Combined with a good leguminous cover crop, such a system of cultivation, carried out from the beginning, would, I am convinced, improve the growth and health of the rubber immensely.

The tapping of rubber trees is, I think, showing improvement generally, both as regards quality and quantity of bark removed. As regards quantity of bark removed a conservative procedure is more and more coming into favour and very few estates now allow for less than four years' renewal of the bark. The systems by which this is brought about vary considerably, single V's, one quarter half-herring bone, alternate quarters, everyday and alternate day tapping, all find their advocates, and probably the exact system followed is not of primary importance. Experiments are being carried out by the department on this point and will be referred to later : unfortunately, reliable results cannot be expected from these for at least four years, and probably it will be safer to wait eight before finally drawing conclusions from them. Some estates are adopting systems allowing for even more than four years' renewal of bark, while I still find a few that are removing one-half their tapping area each year; the condition of these trees after the second round of tapping must certainly be very poor.

Space to quote more failing us, the following points dealt with in the report may be indicated :

Extra work is thrown on estates by the demand for light crepe, which is no better than any other.

The rubber on many estates should be dried more rapidly.

White ants as pests are decreasing in number.

A minute beetle has been reported from time to time attacking rubber.

Pollarding and pruning often give access to pests. Wounds should be treated with tar. So should bad tapping.

New rubber clearings have been affected by a beetle that often kills 90 per cent of the young plants. The remedy is a cylinder of newspaper round the plant.

Fomes still constitutes the most important disease of the plant. Brown root disease occurs only in small quantity.

Diplodia (die-back) has been met with commonly in the year. Another fungus causes death to the tips of young shoots and gives a foothold to diplodia.

Two leaf diseases are reported, but the damage done is small.

Bark troubles require careful investigation and this is to be given during the coming year.

ERI SILK IN ASSAM.

Mr. H. Maxwell Lefroy, Imperial Entomologist, and his Assistant, Mr. C. C. Ghosh, have written an exhaustive account of the Eri silk which is grown in Assam, and it has just been published in the Entomological Series of the Memoirs of the Department of Agriculture in India, priced R3. The silk differs from other silks in that it cannot be reeled, *i.e.*, a single continuous thread cannot be obtained from one cocoon as is done in mulberry silk. The cocoon actually is not formed of a long continuous thread as in mulberry silk but is spun by the worm in layers. It differs also from these silk cocoons in that it is so made that the moth can push its way through one end without softening or cutting the fibres, this end not being really closed but being so blocked with loops of silk that nothing can get in but the moth, pushing from within, can force its way out. The silk has also this peculiarity, that to get it the cocoons need not be steamed to kill the insect within, as must be done with mulberry or tussore silk ; the moth may be allowed to mature inside the cocoon and emerge. This removes one of the objections to mulberry silk, in that no life need be taken before the silk can be obtained. The Memoir is excellently got up and well illustrated.—*M. Mail*, June 6.

BEESWAX FROM ESPARTO GRASS.

In the report by the Chief Inspector of Factories and Workshops, Mr. Newlands, Dundee, reporting on the papermaking industry, says: "The dust given off in handling esparto grass has long given trouble, and suggestions of fans, etc., were not well received. A local firm, after some years of experiment, have found this dust of considerable commercial value, and by a new process are extracting beeswax from it. Acting in co operation with one of our leading dust-extracting engineers, they have approached the trade offering to buy this dust at a figure that well pays for the installation of dust-extracting plant."—*Chemist and Druggist*, June 29.

WORLD'S VANILLA CROPS.

Mr. Hermann Mayer Senior has issued his annual vanilla statistics, showing the world's production to be 590 tons for the year 1911; these were shipped to the various trading centres during the 1911-12 season, and were composed as follows:—

	Tons		Tons
Bourbon	65	Guadeloupe and Martinique	16
Seychelles	13	Mexico	145
Comoro and Mayotte	70	Tahiti	195
Madagascar	60		——
Nossi-be	10	Say about	590
Mauritius, Java, Fiji and Ceylon	15		

The total yield shows very satisfactory dimensions, notwithstanding the shrinkage in the Seychelles and Tahiti returns, but as twice in succession no stocks of consequence were left to be carried forward into a new season, the market maintained its high level, subject, of course, to the inevitable fluctuations which a passing shortage or accumulation, large arrivals of immature parcels, or occasional ulterior motives of speculators, must produce.—*Chemist and Druggist*, June 1.

TEA-CHEST-WOOD BEETLES.

As a result of the discovery that tea-chests, in which tea had been sent from Calcutta to Australia, were found on arrival to have been attacked by boring beetles which were boring in the wood, an enquiry was commenced by the Indian Tea Association, Calcutta, and its Scientific Department have now issued a short preliminary résume of its investigations in pamphlet form: "Damage by Beetles in Tea-chest Woods" by G D Hope and C B Antram. A long list is given of the various insects found in tea-chest woods, many of them were casual visitors, the worst pests being beetles of the family of 'shot-hole borers.' The wood is most frequently attacked where stored and left undisturbed in godowns, etc., in contact with saw dust and wood refuse. Soft woods are attacked to a greater extent than hard ones and unseasoned wood is attacked more readily than seasoned.

THE TEA PLANTER AND SECRETS YET TO LEARN.

Until the planter learns how to command the elements and make them subservient to his will, he will never succeed in making the same rich quality of tea *the year round.* Nature's secret has not been wrested from her, and we question whether it ever will. Notwithstanding the efforts of our scientific officers, no advance has been made in tea manufacture. We are still groping in the dark and waiting for the light to enlighten us. We were told some months ago that some wonderful new discovery had been made with regard to a new system of fermentation which was going to revolutionise our present method of manufacture, but it appeared to have fizzled out, for nothing further has been heard of it. Great expectations, sadly disappointed,—*Indian Planters' Gazette*, Aug. 3.

THE VALUE AND PURPOSE OF GRAPHITE APPLIED TO RUBBER.

The application of graphite to the outer surface is found mostly in packing material, such as asbestos-rubber manhole rings, stuffing-box packing, etc. In the case of different articles the method of use and the purpose of the graphite is different. In manhole rings, and packing sheets and rings, the thin outer layer of graphite is to prevent the adhesion of the packing to the surface of the iron that is caused by heat. A ring rubbed with sufficient of good graphite is easily taken off. It is the view in some quarters that the graphite must not be necessary, since many engineers buy manhole rings without the graphite. But the engineer puts on the graphite himself or adds red lead. This he does also with ordinary rubber manhole rings. If graphite is not used adhesion results, and the taking off leads to tearing, the use of a chisel being necessary in some cases. In stuffing-box packing the graphite is used to give greater smoothness and easier running. It is more efficient than talc, and to stuffing-box packing filled with talc, graphite is often also added—*Gummi Zeitung*, May 31.

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GRAPHITE IN GERMANY AND SPAIN.

Washington, June 28, 1912.—Consul-General Skinner, at Hamburg, Germany, has sent to the Commerce Department here an account of the graphite industry and trade of that country. Some discussion of the same subject is also contained in a report which the department has received from Consul Robert Frazer, Jr., at Valencia, Spain. Mr Skinner, in speaking of the graphite industry of Germany, among other things, says:—

The total importation of crude, ground and scoured graphite into Germany amounts to upward of 32,000 tons per annum, practically all of the business from over-sea countries being concentrated at Hamburg. While the imports from the United States are rather limited in quantity, there is no reason why much more business should not be done if American exporters are able to meet German terms and requirements.

It is exceedingly difficult to submit any satisfactory information in regard to prices, as the variations are considerable in the value of the different qualities. Hamburg firms consulted are all willing to receive American samples, and would then be in position to submit definite propositions. On March 16 powdered amorphous graphite was worth \$2·38 to \$7·14 per 220·46 pounds, and graphite in flakes, both crystals and powdered crystals, \$7·14 to \$28·56. Exporters of graphite to the United States quote good marketable qualities at 1½ to 2½ cents per English pound, c.i.f. Baltimore, shipment in bags. When graphite is packed in casks, the weight per cask is 440 pounds. The

HIGHEST GRADE OF GRAPHITE HANDLED IN HAMBURG IS RECEIVED FROM CEYLON.

There was received in Germany during 1911 about 33,000 tons of crude, ground and scoured graphite, and there was sent out of the country about 40,000 tons.

The report from Spain makes the following comments on the situation in the graphite trade of that country:—

Graphite crucibles and pulverized plumbago are used by the several small bronze and steel foundries in operation in the Valencia district, but only on a retail scale. Purchases are effected almost exclusively through travelling representatives of English or German exporters who pay periodic visits and call personally on all consumers to book orders, which, although individually small, in the aggregate appear to be of sufficient importance to warrant the expense of travelling salesmen. These travellers, however, do not offer graphite products alone, but generally carry also belting, greases, miscellaneous supplies and machinery. Their headquarters are usually at Barcelona, but some come direct from England and Germany.

The plumbago imported in barrels by steel and other metal foundries has of late usually come from Germany and appears to be relatively cheap as it is sold wholesale at the equivalent of 3½ cents per pound. There are no local wholesale dealers or jobbers handling graphite products.

In the absence of a special travelling representative to look after their interests in this country and an adequate stock of specialties always on hand here or at Barcelona, American graphite manufactures would probably meet with more success in introducing their products by interesting one of the important distributing agencies and commission houses established at Barcelona handling general machinery and machinery and workshop supplies, belting, lubricants, etc., which have travelling salesmen for all Spain.

The Spanish tariff on plumbago is only about 4 cents per 100 kilos (220·46 pounds). There is no native source of graphite in operation in this country at present and all consumed here is imported.—*New York, Oil Reporter*, July 1.

SMALL FARMING A SCIENCE.

WHAT MIGHT BE DONE IN CEYLON WITH TRUCK RAISING.

Behold! From the ancient and plodding 'man with the hoe,' who once left his bed before sunrise, and worked until after dark, to 'keep the farm going,' and who often died in the 'harness,' with little more than a few acres of land and a roof over his head, we have today eolved the modern farmer of science, who arises at a decent hour, eats breakfast with his family rides over his domain in an automobile, and returns in time for dinner to report prosperity and improvement in the 'farm his father had run for sixty years on the old-fashioned scale. Of course, this is not universal; but we use it in comparison of the past with the present, and it can be safely said that small farming has developed in proportion, with the same remarkable prosperity, where up-to-date, scientific methods have been employed. We cite as a specific incident the case of a farmer, who according to the *World's Chronicle*, of June 22, began truck farming on 12 acres of almost barren land in Ohio. He did not understand farming when he began, but he learned, and after fertilising the land, it improved. From a small beginning he has developed the farm until he derives an annual income of £200 per acre, meaning that he makes £2,400 a year off a patch of ground that had previously been given up to stone heaps and been a dumping-ground for everything. This shows what small efforts grow into with proper knowledge, industry and thrift. Some months ago, when we published the results of our own model farm, and small farming in Ceylon, great interest was aroused, and we received many letters of enquiry, some of which we printed at that time. The demand for first-class truck, or vegetable farming in Ceylon is growing far beyond the supply. Not a week passes, that widespread complaints are made by our hotels, European residents and the population in general of Colombo and other places, that the quality of our garden produce is very poor and growing worse each year. This is chiefly because next to no attention whatever is given to the methods employed, the seeds or plants used, or the condition of the soil. We are quite certain that if those who are at all interested in small farming, will secure the co-operation, first of the Department of Agriculture, then secure a few acres of land in the foothills, or upcountry, where garden truck can be raised, they will find by giving the business close and methodical attention, it will not only yield them a good livelihood, but considerable profit will be ultimately realised, if the project is not given up, through lack of enterprise, or wrong methods used.

Referring again to the small farmer and his 12 acres in America, we learn that he was compelled to use 800 tons of fertilizer on his land each year. Gardening land in Ceylon would not require anywhere near such an outlay in this respect. There is not a chicken or cow on that farm. He considers them too much trouble to look after, and they take up too much space. Eggs and milk are purchased from neighbours. Six horses are maintained to work the farm, and to do the hauling to and from the city. Here, the situation might justify the keeping of a cow, a few chickens, and with the required pairs of bullocks, the same results could be accomplished. This Ohio farmer does not believe in mixing his business as a truck grower with that of a fruit farmer. This is an important feature of small farming. Too many go in for a little of this, a little of that, and the result is a little of nothing. This farmer watches every detail. He knows how to buy and sell, how to sow and reap, and to see that nothing is wasted or lost. He works with his men, not *over* them, and encourages them to improve constantly. In the winter—a season our farmer does not have to face in Ceylon—he raises tomatoes, lettuce, asparagus, cucumbers, etc., in hothouses maintained for that purpose, and while his neighbours' farms are under snow, he is getting big prices from the city for his produce. In Ceylon we can raise produce the whole year round!

We feel safe in predicting that if 100 or even more Europeans, who were interested in farming in Ceylon, would each take up 12 acres of land upcountry, or the nearest land suitable for growing truck (vegetables of all kinds, including potatoes, cabbage, lettuce, cucumbers, tomatoes, turnips, parsnips, etc., etc.) thoroughly familiarise themselves with the subject in hand, apply the best methods, the proper amount of energy, patience and thrift, Ceylon farming, within three years' time, would be famous throughout the East. We have only to point to what some of the industrious Chinese gardeners in Burma, India, Straits Settlements, and some of the Dutch gardeners in Java have done, to see that what we propose is not only possible, but can be made profitable. Every hotel manager in Ceylon, every resident using vegetables, we are certain, would give such a project their unqualified support and patronage.

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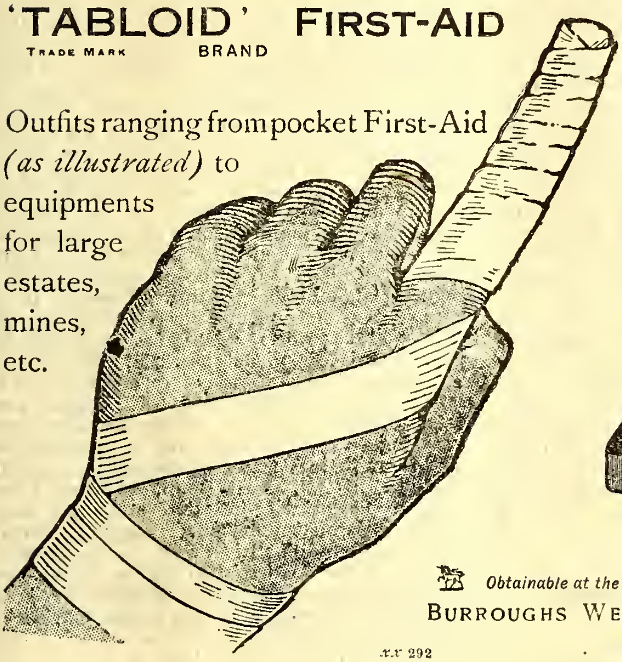

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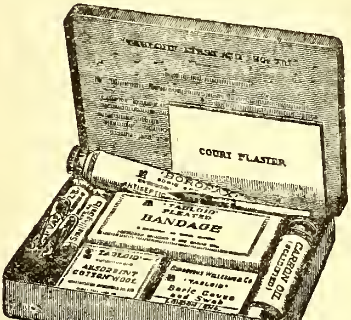

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RUBBER TAPPING IN MINDANAO THRIVING.

MOROS INDUSTRIOUS AND RICE AND OTHER CROPS ENCOURAGING.

Mr A W Prautcb, who holds the reputation of being the greatest rubber enthusiast within the boundaries of the Philippine Islands, arrived in town on the steamer "Neil Macleod," yesterday, from Lebak, Mindanao, where he is now nursing along a budding para rubber plantation. Lebak, is about 70 miles from Cotabato.

"The rubber plantation is coming along nicely," said Mr Prautch at the *Bulletin* office. "The trees are now a year old and have reached a height of twelve feet. In the Straits Settlements para rubber trees grow only 10 ft. a year.

"The plantation borders on a perfectly landlocked navigable bay and extends five miles inland, sloping toward the mountains. A swarm of locusts visited the plantation recently but did not leave the slightest trace of havoc behind them. I examined as many of the leaves as I could but did not find even a tiny hole in any of them. This proves conclusively that Para rubber trees are immune from the ravages of locusts.

"The Moros in our region are very industrious and hardworking people. They raise lots of rice, both the upland and lowland varieties. The upland rice fields were visited some time ago by locusts when the crop had reached a height of about 4 inches. The insects totally destroyed it. But the Moros at once planted another crop, which promises to be a bouncer.

"Cotabato valley is ideal for lowland rice cultivation. The river like the Nile, overflows for several months each year, during the heavy rains, in July, August and September. The alluvial deposits of the river make excellent rice soil. Cotabato raises enough of this staple to export the product to other provinces. There is a steam rice mill in the district.

'Major Heiberg, the Governor of Cotabato, some time ago, in anticipation of a shortage, enforced a prohibition against the exportation of rice from the province, but it was soon found that the supply was far above the requirements of local consumption, and the prohibition was removed.—*Manila Bulletin*, July 24.

THE LANGUAGE OF THE AIR.

Napoleon boasted that he had abolished the Alps. The modern aeroplane may be credited with having abolished frontiers. The question is, what language is to be spoken by these new citizens of the air, who start a voyage in one country and complete it in another. M Henri Farman, than whom no one has a better right to be heard on the subject, in a letter to a London morning paper advocated Esperanto. The advantages to airmen of obtaining at least an acquaintance with this international language are obvious. Wherever he descends, the flying man is likely to find some local schoolmaster, railway official or other intelligent person who

knows it, and can, in consequence, understand his wants. In a report addressed to Messrs. Burroughs Wellcome & Co., M. Farman emphasises this and indicates at the same time the utility of another accomplishment, namely a knowledge of first-aid.

"I am happy to know," he reports, "that you are using the Esperanto language for your commerce, and I beg to congratulate you. As I have often said before I find it is very necessary for every aviator to have with him one of your 'Tabloid' First Aid cases, and to know Esperanto. With these two he can go anywhere Fortunately I can say that I have not yet had a serious accident, but working on the various apparatus, I have hurt myself several times, and was then glad to use the 'Tabloid' case which saves much valuable time. It is very necessary for aviators who go to all countries to know Esperanto and to possess a 'Tabloid' case for first-aid. In this way he can go anywhere and be his own master. This is the advice which I give always from my heart to the novice aviators in my schools, for although it happens very seldom that aviators injure themselves seriously on my machines, notwithstanding their very large number, yet it is wiser to exercise foresight."

RUBBER IN SOUTH COORG.

Weather and Planting.

Pollibetta, July 24.—A spell of heavy wet weather set on the 19th instant, since when, although the heaviest fall recorded in the 24 hours was over 3 in. and on every occasion more than an inch, yet the rainfall is lighter than is usual at this time of year. Both coffee and rubber are in very good heart. Most estates are through with the destruction of borer, and now attention is being paid to weeding, and work in connection with the filling up of vacancies. It is to be noted that "stump rot" is more severe in fields of rubber than in the coffee. This may be due to the rubber roots penetrating more deeply and coming in contact with large decaying roots which would be out of reach of coffee roots.—*M. Mail.*

RUBBER IN UGANDA IN 1910-11.

The following particulars respecting the trade of the Uganda Protectorate for the year ended 31st March, 1911, have been taken from the report by Mr. G. D. Smith, Treasurer and Chief of Customs, Entebbe :—

There was a decrease in wild rubber owing to the trees being rested for several months towards the end of the year. The first export of plantation rubber was made during the year under review; it was of the Ceara variety, and was tapped from trees about three years old, and fetched 8s. a lb., with best Para rubber at 8s. 10d. to 9s. The Ceara variety of rubber is being largely planted and shows every sign of being successful.—*Board of Trade Journal*, May 30.

FAILURE OF COCOA VALORISATION.

In his report on the trade of Ba ia for 1911, Mr Consul W H M Sinclair refers to the failure of the cocoa valorisation scheme. He states that a scheme was mooted in the course of the year to bring about a system of valorisation in the cocoa trade similar to that which is in operation in the case of coffee, in the State of Sao Paulo. It was proposed that the cocoa planters of Bahia should act together with those of the Portuguese colonies and of Ecuador to neutralise the effects of speculation in the European markets. The main features of the scheme were that the cocoa should be exported to Lisbon and stored there, the price to be controlled by persons appointed by those interested in the countries mentioned. The Bahia cocoa crop was held up while a congress discussed this project at Bahia in October. It, however, got no further than the stage of discussion. In the first place the originators of the scheme exaggerated the proportion of the world's supply contributed by the countries in question, setting it at 75 instead of 50 per cent. Secondly, cocoa cannot be stored for more than a very limited period without deteriorating, unlike coffee, which is the better for keeping. Thirdly, the financial difficulties were insuperable. A final blow was dealt to the congress by the circulation of a report that the crop from the Portuguese colonies was being put on the market and fetching a good price in the absence of other supplies.—*H. & C Mail*, June 14.

BRAID MANUFACTURES HAVE IMMENSE PROFITS.

Promising Industry That Would Meet Favour in Markets of the World.

The Philippine Islands are weak in their production of braid hats. The islands, however, produce no braid for hats which in the world's trade is of much more importance than the hats themselves.

One thousand per cent of the present plaid braids, of straw, bast, chips, and numerous other materials are manufactured in Switzerland, Germany, France, Japan and China, and other parts of the world.

Fully ninety per cent of the straw hats worn in the Philippine Islands are made locally and all the braid made for them is imported from foreign countries.

The cause for this is not because materials do not exist here in large numbers and in great variety, but that the people do not realise the value of these materials nor the profits to be made from braiding. The local field for ordinary straw braids from which the common straw hats worn by men are made is very large.

There is also an even greater field for making braids for the export trade pertaining principally to women's hats. It has been said that there is nothing too fantastic and bizarre for a woman to wear on her hat,

The braid manufacturers of Europe are always waiting for something new in the line of material for braids, and when they get such a material their profits are often very much larger; five hundred per cent profits are quite usual and they often run to one thousand per cent when a particularly fetching braid has been hit upon.

There are numerous materials in the Philippine Islands which could be made into braids, and if these were to appear in the world's market, and were established as a mode would command a very high price.

Local exporters are receiving requests continually for such materials. The greatest profit to the Philippine Islands will result by having the people make braids locally in their homes than by sending the raw materials to Europe and having the one thousand per cent profit made there.

Among these materials are skins of Pandans, of the palms, and of buntal fibre from which so many costly hats are now made, and a considerable number of bast fibre.

Ceylon produces some of these materials, which might be used for braid manufacture, which has become an important industry in tropical countries.

NOTES FROM THE PHILIPPINES: RICE PALM PITH, FIBRE, SILK, &C.

Manila, July 23rd.

Dear Sir,—A few facts to be gathered from today's *Bulletin* may be interesting:—

(a) Natives are eating the pith of the Buri palm in the Oriental Negros Province as the rice crop is short, owing to the late long drought. I think this is the same as the palmyra palm. The leaves are used to make hats of a very fine quality. The pith is probably like sago. It would be interesting to know if the pith has ever been eaten in Ceylon. It is a pity to destroy these valuable palms, and these people will not plant others.

The Government have purchased a large stock of rice, to send to Provinces where rice crops are short, and will sell it cheap where dealers have raised the price too high. The same thing was done last year, and will have to be done every year, as these lazy, shiftless natives are too lazy to cultivate enough rice for their own living, and have to import an immense quantity from Saigon.

(b) In Cebu Province locusts have done serious damage to crops. In one part 80 sacks of locusts were caught. They are generally caught in butterfly nets, and are roasted and eaten.

(c) The "Sinamay" cloth made from Hemp fibre is strong, coarse and transparent, and is used as a lining on the lower part of dress skirts to stiffen them.

This fibre is exported largely, and is woven into braids in Switzerland, France, and Italy, and the braids are woven into the finest ladies' hats. The Bureau of Education will probably get the fibre woven into braids and hats, which can be sold much cheaper than those made in Europe.

We have plenty of rain now, and will probably have floods.

There is a good deal of dengue fever in Manila at present; caused by mosquito bites. The Government Entomologist has 30 men at work, pouring kerosene oil on stagnant pools.

I introduced the Ceylon hybrid silkworm here, and suggested to the Government Entomologist to import Japanese silk-worms and cross them with the Ceylon kind, and the result is a great success, as they have 50 per cent. more silk than the Ceylon worms. I think the Ceylon kind has eight generations in a year, and the Manila kind *13*. The silk farm at Peradeniya should import Manila and Japanese silk-worms.

—Yours very truly,

S.

THE NEW SYNTHETIC RUBBER.

"Truth" on the New Product.

For the last thirty years it has, of course, been known that an artificial rubber can be made from isoprene, and those who have followed the various scientific discoveries also know that all the artificial rubbers so far produced have lacked those physical characteristics which give natural rubber its commercial value. Rubber, as produced by nature, my scientific friends tell me, depends for its peculiar properties more upon the complexity of its molecular arrangement than upon mere chemical composition. Physical identity of structure is of even more importance than chemical similarity, and it is this which renders the synthetic production of rubber a problem of such extraordinary difficulty. The tyre manufacturer cares little whether the synthetic substance answers chemical tests in the same way as natural rubber. The first questions the manufacturer asks are with regard to the physical characteristics of the new compound. Are its resilience and tensile strength equal to that of real rubber? Has it the same durability? When turned out from the laboratory these synthetic compounds look like rubber and feel like rubber. Moreover, they may vulcanise like rubber, but they are obviously of no commercial use if on being exposed to sunlight they gradually collapse into one of those sticky masses which were shown under the name of synthetic rubber at the last International Rubber Exhibition.

What, then, have Professor Perkin and Dr. Matthews to say with regard to the physical characteristics of their product? Scarcely a word. Experiments have been wholly confined to the chemical side of the problem. . . . . Even in the event of synthetic rubber getting beyond the laboratory stage it is highly improbable that it will compete successfully with plantation rubber either in physical properties or in cost of production, and it is doubtful whether so much publicity would have been given to the recent discovery were it not for the fact that a certain group are desirous of raising £450,000 on 6 per cent participating preference shares for a company to be known as the Synthetic Products Manufacturing Co., Limited. The advance prospectus is mild enough, synthetic rubber being the least prominently dis-

played of the three materials in the manufacture of which the company proposes to engage. An income sufficient to pay good dividends can, we are assured, be made out of acetone and fusel oil, leaving the company free to experiment with synthetic rubber for a couple of years before a factory is erected. Not a single rubber man is on the board, and the list of directors is headed by Sir Willigm Ramsay, whose scientific achievements entitle him to respect, but whose optimism connected him with a company scheme for the extraction of gold from sea-water, and with a number of other ventures of no greater practical utility. In order to secure underwriting it is hinted that the vendors may be induced to part with some of their shares at 12s 6d., but there is no great rush for the privilege of subscribing, and to exchange plantation shares for synthetics would be to exchange the substance for the shadows.—*Truth*, June 26.

WILL SYNTHETIC RUBBER BECOME AN AUXILIARY TO PLANTATION.

July 10th.

Dear Sir,—I have been reading a lot lately about the great synthetic rubber scare, a substance which now seems fairly on the way to becoming a success, that is to say, a substance of some considerable commercial importance, if cheaply produced. From the time we started planting out rubber on our Ceylon estates, it always struck me that the two terrors we had to face were: first, the scientific man, and, secondly, the dearth of labour for cultivation, as the order of the day seemed to be to cram it in, in every corner of the tropical world, utterly regardless of ever being able to harvest it—to say nothing of finding a sale for it at paying prices. The one and only reply I ever got was: "You must remember, that really the best thing that can happen to our plantation rubber is a fall to 2s. 6d. or 3s., when up will go the consumption of it for innumerable purposes, for which its present-day price is prohibitive." One thing, I think, seems pretty clear to most minds, and that is, that the success of synthetic would be sure to cause a halt in the present-day great rush into rubber planting. Now, putting synthetic at say 1s. 6d. and other rubbers at 2s. 6d., average 2s., what, I ask, would be the probable result? I think it would result in South America closing down, and such a demand for rubber for flooring and roofing of buildings, that an immediate rise in price of all kinds would take place, when the plantation average, depend upon it, would soon be the same as it is today, if not higher, and a good healthy price with a general production hardly equal to the demand, which is bound to be very great.

I think it is very doubtful, too, if any artificial substance will ever be made to take the place of real rubber, as regards general utility and to stand wear and tear, so that while synthetic may become the means of increasing the uses of rubber generally it will never succeed properly in that direction, save by the veneering of it with our pure plantation kinds. I have not the least doubt that if 75 per cent of synthetic and 25 per cent pure rubber be used, the latter for veneering floor cloth and flooring blocks, etc., an immense demand will spring up for all kinds—and a demand, too, we can never look for with our pure article, certainly not at its present price.

In conclusion, I do not think we have much to fear for some years to come.—Yours faithfully,

L. S. P.

EASTERN TAPPING EXPERIMENTS.

We are glad to be able to report that our criticism on the Ceylon experiments, and the publicity thereby given to them, has aroused considerable interest in the plantation industry. It has been decided, through the agency of the Rubber Growers' Association, to circularise the leading companies now in possession of tappable areas, requesting them to carry out definite experiments in frequency of tapping. In order that all should be fully advised, a reprint of the article referred to by us last week, in which the criticisms made by "The India-Rubber Journal" are outlined, is published. This is the first time, to our knowledge, that a recognised public body has taken such a deep interest in the detailed work of the estate, and we trust that the result will be reliable.

In the form supplied for filling up by superintendents, the following information is asked for:—Number of trees; period over which experiments were conducted; total amount of dry rubber obtained during period (including scrap); method of tapping, whether on the one-third or one-quarter system; inches of bark excised during experiment; age of trees; average girth of trees; how long the trees were tapped before this experiment. It is further suggested in the form issued by the Rubber Growers' Association that four periodicities shall be experimented with, viz., tapping once every three days, once every four days, once every five days, and once every seven days. It is assumed that if the experiment is carried on for 90 days the number of tappings will be 30 for the three days period, 20 for the four days, 18 for the five days, and 13 for the seven days period. These then are the particulars asked for officially.

It seems almost superfluous for us to state that we are delighted at this evidence of interest our criticisms have aroused. We are, nevertheless, much more pleased with the prospect of getting information of a reliable character direct from the planters, which may have a very great influence on the labour problem in the East, and the preservation of healthy rubber trees. It should be pointed out, however, that experiments regarding periodicity of tapping are not quite so simple as the layman may first imagine. In order to carry out experiments which may be of value, it is necessary that there should, as far as is practically possible, be absolute equality on all points except that which remains to be determined. Once the determi-

nation has been made under these somewhat ideal conditions, further experiments are necessary (and will be suggested as the outcome of the series) upon the average trees met with on an estate. In carrying out experiments of this kind two qualities are essential; first, keen observation, and second, absolute accuracy. These two points must be guaranteed if the results from all the experiments are to be used as a guide.

POINTS TO BE BORNE IN MIND.

With the object of increasing the value of the document sent out officially, we have several suggestions to make. In the first place we think it advisable to determine the value of tapping periodicity not only at three, four, five and seven day intervals, but at intervals of one and two days. At the present time most estates are tapping each tree daily, or every alternate day, and the point of most interest is whether the other frequencies mentioned are better than those now commonly adopted. We have therefore in some of the forms sent out to managers added one day and two day intervals. This should considerably enhance the value of the results obtained.

The second point is in relation to the number of trees in each group. It is obvious to everyone who has had practical experience in tapping, that the quantity of latex obtained from apparently similar trees varies considerably. The only way in which this variability can be minimised is to take in a very large number of trees, and to continue the experiments over a very long period of time. There are, however, on most of the estates where the experiments can be conducted, limitations in this respect. As a practical suggestion we would request each manager to reserve 100 trees in each of the groups enumerated.

The third point, which appears to be of perhaps the greatest importance, is that the trees to be experimented upon should be equal in all respects as far as possible. They should be of even appearance, age, and size; they should be the same distance apart, on soil of similar character and aspect, and grown under the same system of cultivation. The reason for this suggestion regarding equality will be at once clear to every planter. The yields obtained from the same aged trees on the top of a hill would be widely different from those obtained at the base of the hill. Similarly the crops from trees of the same age, but planted at different distances, with or without intercrops, would show big variations. If one does not secure identical conditions as far as the plants and their environments are concerned, the results will be of no value; too much importance cannot be laid on this point.

The fourth point we wish to bring forward is that in relation to the condition of the trees on which the experiments are to be made. We would prefer that the trees to be tapped should either never have been tapped previously, or have been tapped to approximately the same extent. Our reason in suggesting this is that if trees are selected which have been tapped in different ways, the results from them, even if tapped at the same frequency, would not be identical. Trees which have been tapped have usually had the bark removed in a more or less systematic manner, but if the quantities of bark removed and the methods of tapping employed in the past are not identical, then the experiment would not be of much value. It is extremely difficult to determine the effect of past tapping on future yields at sight, and therefore we would prefer that the trees selected should not have been previously tapped. This would give, in our opinion, more equal conditions than any other system of selection.

Our fifth point is in relation to the tapping lines and the bark shavings. It is not sufficient to ask for the number of inches of bark, between the parallel tapping lines, excised from above downwards; is it in our opinion necessary that the tapping lines on all the trees should be of exactly the same length, and sloping at the same angle. If the lines are not of the same length, than the yield will vary apart from the system of tapping; if they do not slope at the same angle the same result would follow.

With reference to the bark shavings removed during each tapping operation, we suggest that it be of the same or minimum size and depth, and that the tapping experiments on all trees be commenced at the same date.

As a last suggestion we would point out the necessity of keeping all records of rubber, including first quality, lump, scrap, and earth, quite separate.

We trust that the suggestions we have made will enable those who undertake the experiments to eliminate many of the errors which they will otherwise have to contend with. It must be borne in mind that the variability in yielding-capacity of Hevea bark is enormous, and that many other suggestions could be put forward which would reduce the liability to error. It must not be expected that the results in the different countries will be identical, or that those from even different estates in the same island will be the same. We anticipate widely-different results from the wet, black soils of Klang, the light volcanic soils of Sumatra and Java, and the rocky hillside of Ceylon; but we also realise that the results will serve as a stepping-stone to further experiments which will, if properly conducted, be of real value to the planting community.—*India Rubber Journal*, July 20.

RUBBER TAPPING AND BARK RENEWAL PERIODS.

Oru readers will remember that some time ago we had an opportunity of drawing attention to certain Ceylon experiments with Hevea trees. The statement we questioned was one to the effect that the interval between successive tappings, provided that it does not exceed a week or so, makes no difference to the yield of rubber per tapping. We have given our view of results obtained by tapping every day or every alternate day, and the reasons which have led us to advocate a minimum period of four years for bark renewal.

[From the *Tropical Agriculturist* for May, 1912, Dr. Lock's views are then quoted.]

EIGHT YEARS' BARK RENEWAL.

We have given very copious extracts from the article referred to, and for the moment our main interest lies in the statement that under certain circumstances a period of bark renewal of eight years may be superior to one of four years. We hasten to assure our eperimenters that we would welcome such a period were it found possible to adopt it with an assurance that crops would not suffer in consequence. Our views on the retention of bark are too well-known to require repetition here.

ANOTHER VIEW.

We sent a copy of the document to a gentleman who has obtained some excellent results by daily tapping young and old trees, and whose experience has been particularly successful. His full reply, without comment one way or the other by ourselves, is here given :—

"The result is certainly very queer and unexpected. So far as I can understand the results, the total yield in the first three years of the experiments was greater by a good deal from the trees tapped at short intervals than from those tapped at long, and it is only in the fourth year of tapping that the results of the latter begin to approximate the former. The conclusion, so far as these figures go, would seem to be that one should begin to tap one's trees at first at short intervals, and that later on one should gradually increase the tapping interval. But this paper only deals with trees of 20 years old, which, until they were 23 years old, gave the best results with the *short* interval My own conclusion from the paper is that these results are not of much value owing to the absurdly close distance at which the trees are planted. 600 lb. odd per acre is an extremely small yield from trees of 23 years old, and the only valid conclusion that one can come to is that they should be cut out and the experiments all begun again before one can form any definite idea as to how the trees would behave if grown under normal conditions. Everybody knows that when trees are closely planted the bark renewal is very poor, and it does not follow that if the bark renewal were good, the conclusions would be the same. Do you agree, Mr Editor ?"

Will our Ceylon experimenters kindly give us their views on those of the correspondent published above? The subject is of more than ordinary interest, and we should much like to have the question freely discussed.

GENERAL PLANTING EXPERIENCE.

So far the results obtained by the writer in countries having a wide range of climate, and in soils having different physical and chemical characters, point to a frequency of forty-eight hours as generally being the best for the estate. We are not so foolish as to assert that the same result would follow the same practice on trees apparently identical in all respects ; we know, too well, that similar trees give entirely different yields though tapped on the same system, and that almost identical results may sometimes be obtained by widely different methods. We believe that the natural variability in caoutchouc-yielding capacity of Hevea trees is enormous, and are glad to note that the experiments in Ceylon have been going on for nearly four years; while the length of time will wipe out many variations, we cannot say the same on the number factor, the fewness of the trees experimented upon unfortunately mitigating the value of the work in progress.

While we find that alternate-day tapping gives a satisfactory yield and permits of good estate organisation, we know that many planters in charge of important estates, e.g., Cicely, Kuala Lumpur, etc., are in favour of reducing the interval, and are going in for daily tapping. A perusal of the chapter on methods of tapping on modern estates, in Wright's "Fourth Edition of Para Rubber," will indicate the number of estates going in for a reduction of the tapping interval. This is a change effected by men who have purely commercial ends in view; we take it that no one will care to deny that the practical man generally selects the sound method in the long run. And yet the recent Ceylon experiments suggest that the longer the interval between tapping (within limits), the larger the yield of rubber per tapping.

We would ask everyone to ponder over the fact that managers—especially in Malaya—previously keen on alternate day tapping, are now advocating daily tapping, against the view expressed by our Ceylon experts that tapping once per week gives larger yields than tapping more frequently. Somebody must be at sea. Either our planters are wasting labour and bark on an enormous scale, or the Ceylon experts are working under conditions and with materials not comparable with an average Hevea estate.

We hope that the suggested delay, owing to stress of work, in submitting further accounts of these experiments will be overcome. The newly-appointed Director, at Peradeniya, would be acting wisely if he placed the publication of these results in hand at once; they are of vast importance, even though somewhat revolutionary, to investors in this country, as well as to residents in the tropics.—*India Rubber Journal*, July 13.

GREEN TEA IN RUSSIA.

With reference to green tea in Russia, the report of H.M Consul-General at Odessa (Mr. C S Smith) on the trade of that district in 1911, has the following: "There has been an extraordinary increase in the demand for green tea, nearly twenty times as much now being imported into Russia as in 1904. It enters principally through Batoum, and is almost entirely consumed in Turkestan and the Russian provinces of Central Asia. It appears that the Mahomedans of Central Asia, whose religion forbids the use of intoxicants, have taken to tea-drinking. Their demand is for green tea, and has created an entirely new market which does not in any way affect the sales of black tea. It may be possible to find similar converts to tea-drinking in other parts of the world, thus creating a fresh impulse to the production of green tea, which had been somewhat discouraged by American legislation prohibiting the importation of tea of the 'faced' description.—*H. & C. Mail*, July 19.

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